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(ATI-0005)

AMENDMENTS TO THE CLAIMS

1-35. (Canceled)

36. (New) A system for plasma processing of a workpiece, the system comprising:

a power generator assembly for exciting gas into a plasma;

a process chamber for processing the workpiece placed therein;

a plasma tube for delivering plasma exhaust from said plasma tube into said process chamber;

a supplemental ion source, located proximate said process chamber;

said supplemental ion source further comprising:

an RF antenna for delivering an RF signal to said plasma exhaust so as to create a primary discharge of ions at a first density and a first energy, said RF antenna being disposed proximate and exterior to said process chamber;

a dielectric window separating said RF antenna from said process chamber, and

a baffle plate assembly for shielding the workpiece from electric field potentials created by said primary discharge, said baffle plate assembly further configured for creating a secondary discharge of ions at a second density and a second energy, wherein said second density is greater than said first density and said second energy is less than said first energy; and

wherein said supplemental ion source is further configured for shielding the workpiece from electric field potentials in a sheath created by activation of said supplemental ion source.

37. (New) The system of claim 36, wherein said baffle plate assembly is interposed between said primary plasma discharge and the workpiece.

38. (New) The system of claim 36, wherein said baffle plate assembly further comprises:

an upper baffle plate having a first plurality of holes formed therethrough; and

a lower baffle plate having a second plurality of holes formed therethrough, said lower baffle plate being separated from said upper baffle plate by an interior plenum;

said second plurality of holes each having a first diameter at one end thereof and a second diameter at the opposite end thereof, wherein said first diameter is larger than said second diameter.

39. (New) The system of claim 38, wherein:

said second plurality of holes define inwardly tapering inner surfaces within said lower baffle plate, beginning at said first diameter and tapering inwardly to said second diameter.

40. (New) The system of claim 39, wherein:

said second plurality of holes comprise a frustoconical section and a cylindrical section.

41. (New) The system of claim 38, further comprising:

a plurality of channels, running through said lower baffle plate, said plurality of channels capable of containing a liquid coolant circulating therethrough.

42. (New) The system of claim 38, wherein said upper baffle plate comprises one of quartz, sapphire, ceramic or sapphire-coated quartz.

43. (New) The system of claim 38, further comprising:

an impingement disk, disposed atop said upper baffle plate, said

impingement disk allowing a plasma discharge to impinge thereupon and be directed through said first plurality of holes.

44. (New) The system of claim 36, wherein said baffle plate assembly further comprises:

an upper baffle plate; and

a lower baffle plate;

wherein at least one of said upper and lower baffle plate is an electrical conductor that is grounded.

45. (New) The system of claim 44, wherein said at least one electrically grounded upper and lower baffle plate includes a dielectric coating.

46. (New) The system of claim 36, wherein said baffle plate assembly is configured so as to cause said secondary discharge to be shaped in substantially a micro-jet formation.